Using NHSN Data Validation for Improved **CLABSI** Surveillance and Prevention

Distance-learning Course
Part 1 of 3

Lynn Janssen, MS, CIC, CPHQ
Coordinator, HAI Liaison Program
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

Today's Presentation

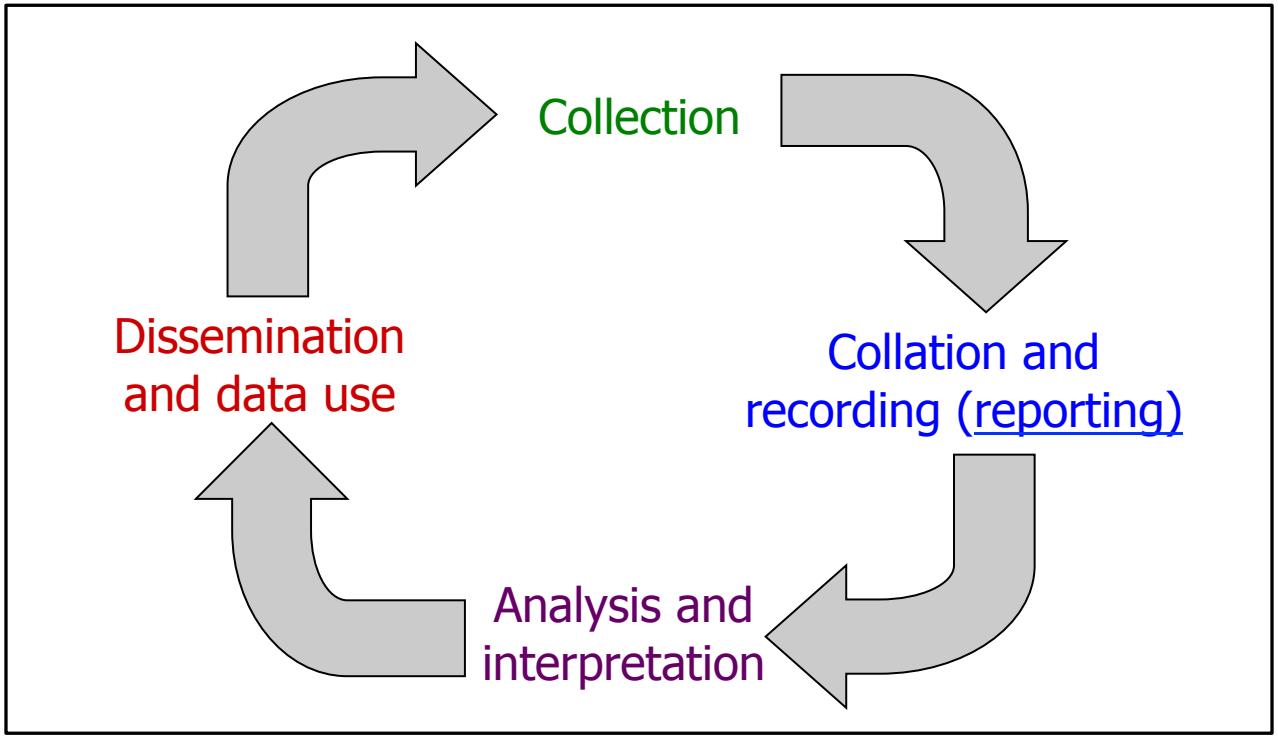
1. Describe the attributes of quality HAI surveillance
2. Identify best practices for CLABSI case-finding
3. Review NHSN CLABSI surveillance protocols and definitions, targeting key issues identified during validations
4. Demonstrate CLABSI data validation process and forms for internal use by hospitals

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

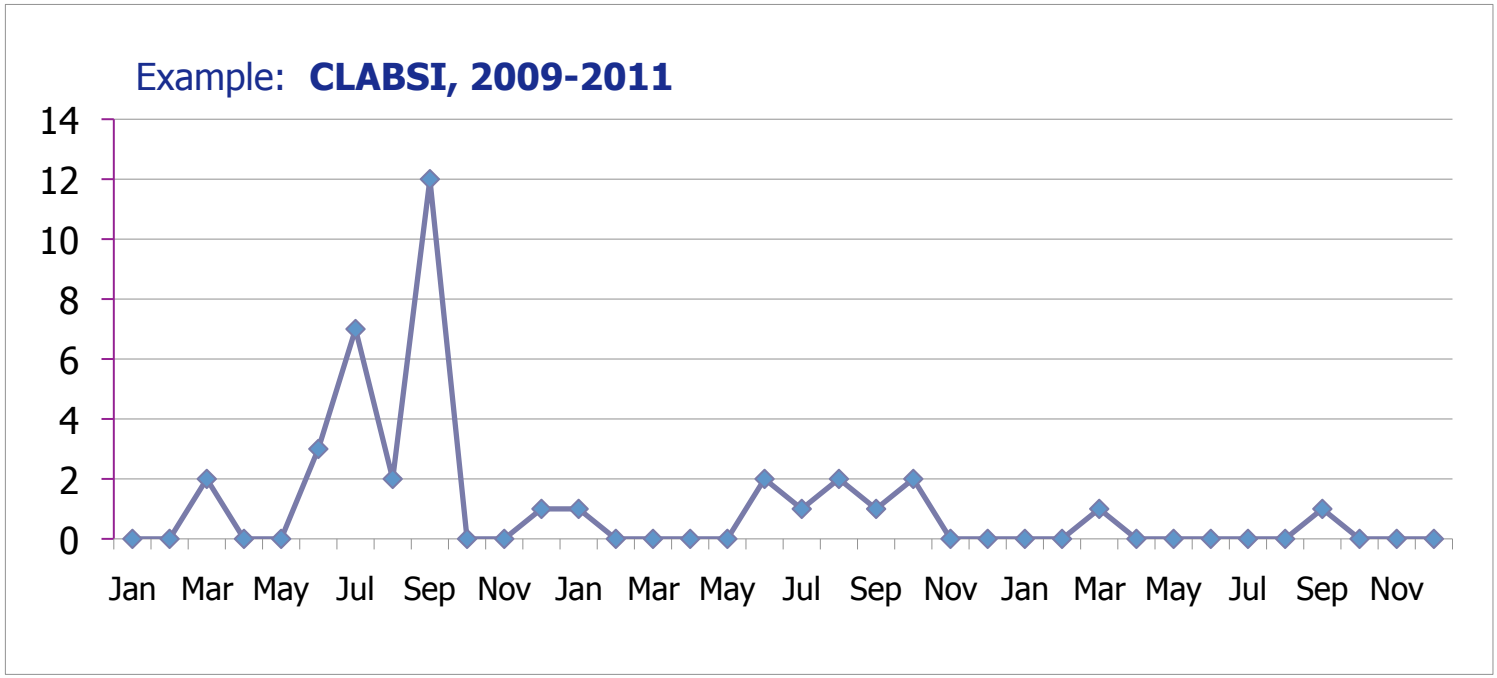
What is Surveillance?

- **System** that starts and ends with communication and action
- **Information** loop or cycle



Endpoint of HAI Surveillance?

- Data that demonstrate **HAI Prevention**



CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Quality Surveillance for Healthcare-Acquired Infections (HAI)

Requires

CONSISTENCY

COORDINATION

CONFIDENCE

COMPASSION

Consistency

Complete case-finding requires a consistent, complete evaluation of a minimum set of clinical data*

	Always Step 1	Step 2
To identify CLABSI	Review every positive blood culture	Review for presence of central line

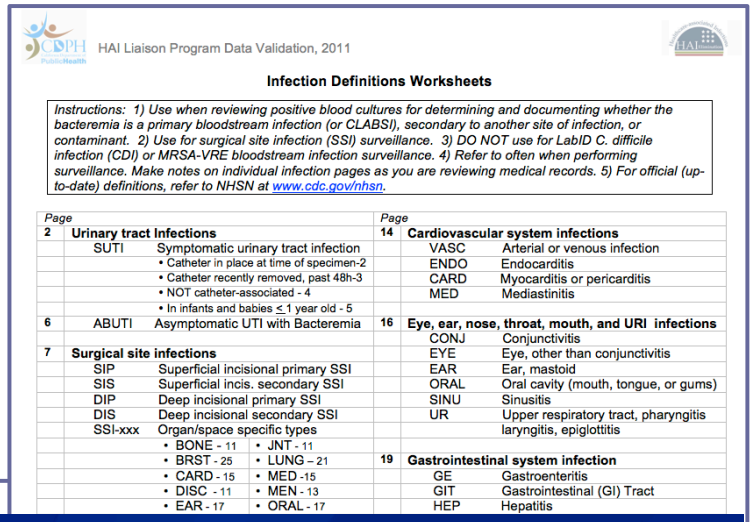
*NHSN protocols currently silent on expectations; revisions proposed

Coordination

- IP can't perform CLABSI surveillance alone
- CLABSI surveillance needs to be a shared responsibility across hospital units (e.g. for central line days) and services (e.g. microbiology lab data)
- The more connection of relevant clinical data points, the better the surveillance (e.g. positive blood culture, presence of central line, confirmation of symptoms)

Confidence

- ✓Know the CLABSI definition AND other HAI surveillance definitions
- ✓Apply definitions with confidence the same way every time
- ✓Seek assistance for ambiguity*

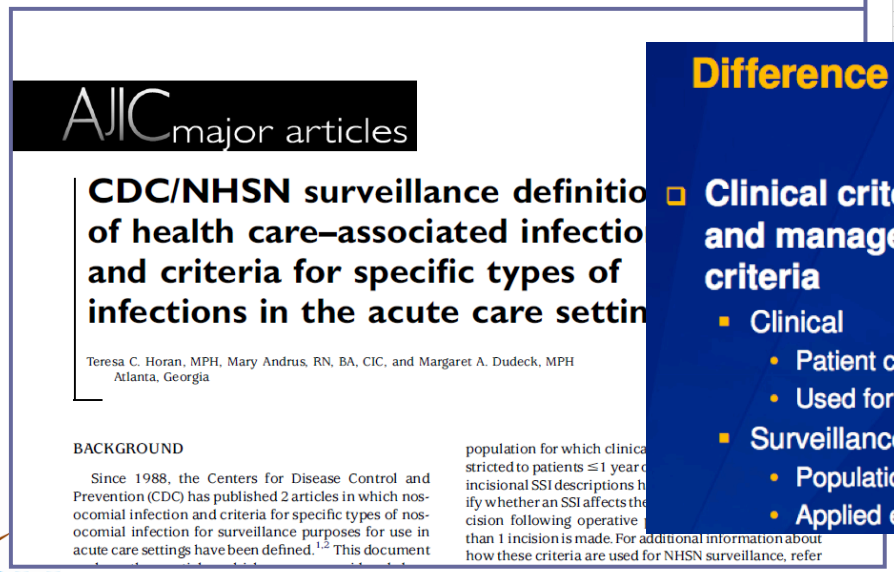


HAI Liaison Program Data Validation, 2011

Infection Definitions Worksheets

Instructions: 1) Use when reviewing positive blood cultures for determining and documenting whether the bacteremia is a primary bloodstream infection (or CLABSI), secondary to another site of infection, or contaminant. 2) Use for surgical site infection (SSI) surveillance. 3) DO NOT use for LabID C. difficile infection (CDI) or MRSA-VRE bloodstream infection surveillance. 4) Refer to often when performing surveillance. Make notes on individual infection pages as you are reviewing medical records. 5) For official (up-to-date) definitions, refer to NHSN at www.cdc.gov/nhsn.

Page			Page		
2	**Urinary tract Infections**		14	**Cardiovascular system infections**	
	SUTI	Symptomatic urinary tract infection		VASC	Arterial or venous infection
		• Catheter in place at time of specimen-2		ENDO	Endocarditis
		• Catheter recently removed, past 48h-3		CARD	Myocarditis or pericarditis
		• NOT catheter-associated - 4		MED	Mediastinitis
		• In infants and babies ≤ 1 year old - 5			
6	ABUTI	Asymptomatic UTI with Bacteremia	16	**Eye, ear, nose, throat, mouth, and URI infections**	
				CONJ	Conjunctivitis
7	**Surgical site infections**			EYE	Eye, other than conjunctivitis
	SIP	Superficial incisional primary SSI		EAR	Ear, mastoid
	SIS	Superficial incis. secondary SSI		ORAL	Oral cavity (mouth, tongue, or gums)
	DIP	Deep incisional primary SSI		SINU	Sinusitis
	DIS	Deep incisional secondary SSI		UR	Upper respiratory tract, pharyngitis
	SSI-xxx	Organ/space specific types			laryngitis, epiglottitis
		• BONE - 11 • JNT - 11			
		• BRST - 25 • LUNG – 21	19	**Gastrointestinal system infection**	
		• CARD - 15 • MED -15		GE	Gastroenteritis
		• DISC - 11 • MEN - 13		GIT	Gastrointestinal (GI) Tract
		• EAR - 17 • ORAL - 17		HEP	Hepatitis



AJIC major articles

CDC/NHSN surveillance definitio of health care–associated infectio and criteria for specific types of infections in the acute care settin

Teresa C. Horan, MPH, Mary Andrus, RN, BA, CIC, and Margaret A. Dudeck, MPH
Atlanta, Georgia

BACKGROUND

Since 1988, the Centers for Disease Control and Prevention (CDC) has published 2 articles in which nosocomial infection and criteria for specific types of nosocomial infection for surveillance purposes for use in acute care settings have been defined.[1,2] This document

population for which clinica
stricted to patients ≤1 year
incisional SSI descriptions h
ify whether an SSI affects the
cision following operative
than 1 incision is made. For additional information about
how these criteria are used for NHSN surveillance, refer

Difference Between Clinical and Surveillance Definitions

- **Clinical criteria used by physicians for patient care and management may differ from surveillance criteria**
  - Clinical
    - Patient centered
    - Used for therapeutic decisions
  - Surveillance
    - Population based
    - Applied exactly the same way each time

CDPH California Department of PublicHealth

*Contact NHSN@cdc.gov or your CDPH Liaison IP

Healthcare-associated Infections HAI Elimination

Compassion

- Patients want to feel safe
- Patient advocates want to be assured that providers are doing everything possible to prevent CLABSI
- Identifying every CLABSI is necessary to understand what your patients are experiencing
- No one should get a CLABSI

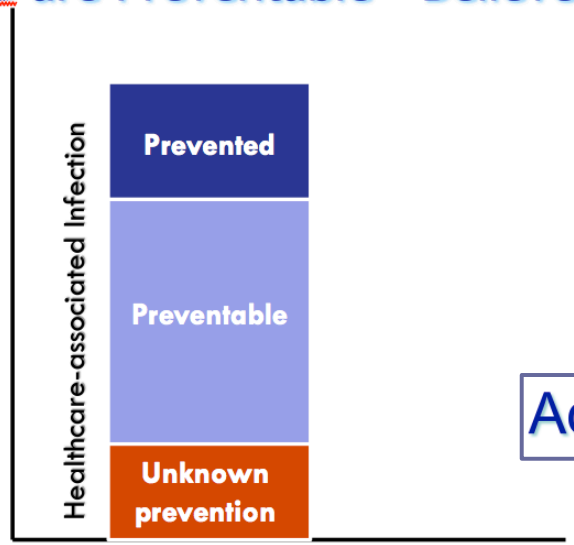
Compassion

Embrace the Cultural Change

Old: "Many infections are inevitable but *some* may be preventable"

New: "Each infection is potentially preventable unless shown otherwise"

Most HAIs are Preventable - Believe it!



Adopt facility goal of "HAI Elimination"

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Objectives of HAI Data Validation, 2011

HAI Program Liaison IPs performed onsite data validation in 100 volunteer hospitals to

- Gain a better understanding of how NHSN surveillance protocols were understood and being applied
- Provide immediate one-on-one education and coaching to volunteer hospitals
- Develop targeted education and training to all CA hospitals based on common errors, identified gaps, misinterpretations

What this validation process was NOT:

- A research study
- Formal evaluation of HAI reporting implementation

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Validation Process

- Performed onsite review at each hospital 1 to 2½ days
  - Team of 2 Liaison IPs (1 IP for smaller hospitals)
- Started with lab line lists for 3 months; required access to medical records
- Assessed completeness and accuracy of reporting for
  - CLABSI
  - CDI (LabID)
  - MRSA BSI (LabID)
  - VRE BSI (LabID)
- Interviewed 2 key hospital staff members (20-30 min each)
  - Denominator data collection processes
  - Hospital location mapping
- Used a standardized set of forms to capture data

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Presentation of CLABSI Validation Findings

- **Sensitivity**
  - Proportion of CLABSI reported by hospitals among all patients with CLABSI
  - High sensitivity indicates CLABSI were identified and reported
- **Specificity**
  - Proportion of CLABSI not reported by hospitals among patients without CLABSI
  - High specificity indicates accuracy of "ruling out" CLABSI
- **Positive Predicted Value**
  - Proportion of CLABSI reported by hospitals that actually were CLABSI
  - High PPV indicates accuracy in applying CLABSI surveillance definition

		Validation Review (Considered "Gold Standard" or truth)	
		CLABSI	Not CLABSI
Identified and Reported by Hospital	CLABSI	True positives	**False positives**
	Not CLABSI	**False negatives**	True negatives

Positive Predictive Value (PPV) = $\frac{\text{True positives}}{\text{True positives + False positives}} \times 100$

Sensitivity = $\frac{\text{True positives}}{\text{True positives + False negatives}} \times 100$

Specificity = $\frac{\text{True negatives}}{\text{True negatives + False positives}} \times 100$

CDPH California Department of PublicHealth

Quick Review of NHSN CLABSI Protocol "Rules"

For CLABSI surveillance, criteria are:

- ✓ Presence of central line currently or within previous 48 hours
- ✓ One or more positive blood cultures (depending on organism), and
- ✓ Clinical review to determine:
  - ✓ If infection present on admission (not a CLABSI)
  - ✓ If BSI secondary to infection at another site (not a CLABSI)
  - ✓ If lab findings represent contamination during blood draw (not a CLABSI)
  - ✓ If patient symptomatic when 2 positive blood cultures of common commensal bacteria (CLABSI)

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

CLABSI Validation Findings

Positive blood cultures, inpatients, 3 mo:	13,259	
Positive blood culture "events" reviewed:	4,099	97 hospitals
CLABSI reported:	135	52 hospitals
Reported in error:	23	19 hospitals
CLABSI not identified, not reported:	68	42 hospitals

Sensitivity	Specificity	Positive Predictive Value (PPV)
62.0%	99.4%	82.3%

Of note:
55 hospitals had identified and reported ALL CLABSI; none were missed
4 hospitals reported CLABSI in error and also missed CLABSI
16 of the hospitals that missed CLABSI had reported 0 CLABSI

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

CLABSI Reported in Error

	Reason should not have been reported
23 of 168 reported "CLABSI" did not meet NHSN criteria	*Secondary to another site of infection – 14* *Contaminant – 6* *CLABSI present on admission - 3*

CLABSI Missed, Should Have Been Reported

	Reason Missed
68 additional CLABSI identified during validation	*Had been ruled as secondary to another infection - 12* *Had been ruled a contaminant – 6* *Had been ruled as present on admission - 4* *Disagreement with NHSN definition – 4* *Had been ruled as a continuation of previous BSI – 2* *Other (reason observed only once) – 5* *Missed* – 35*

* Cases missed most often due to

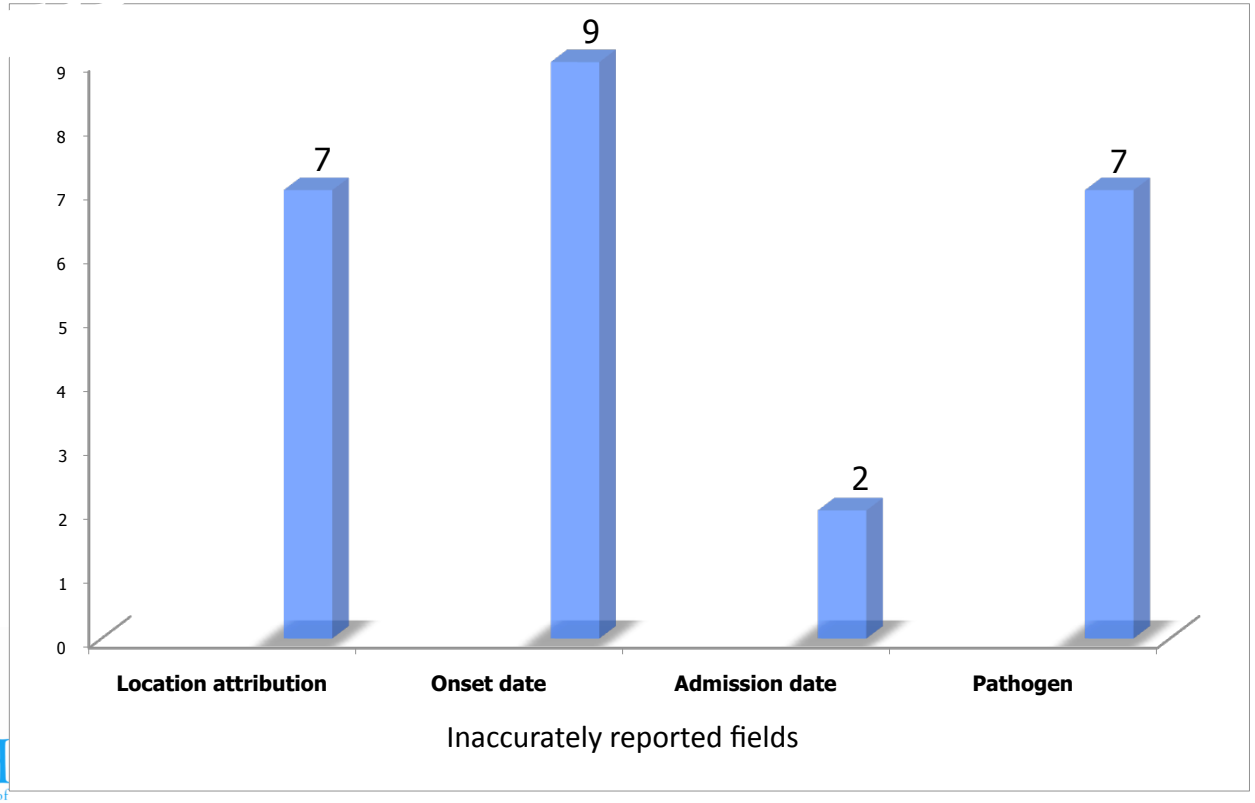
1. inconsistencies between the final retrospective laboratory line lists reviewed during validation and the lists or systems that had been used for IP surveillance
2. Positive blood culture not reviewed (whatever the reason)

Agreement could not be reached for only 8 unreported CLABSI

* Specific details not captured on validation forms

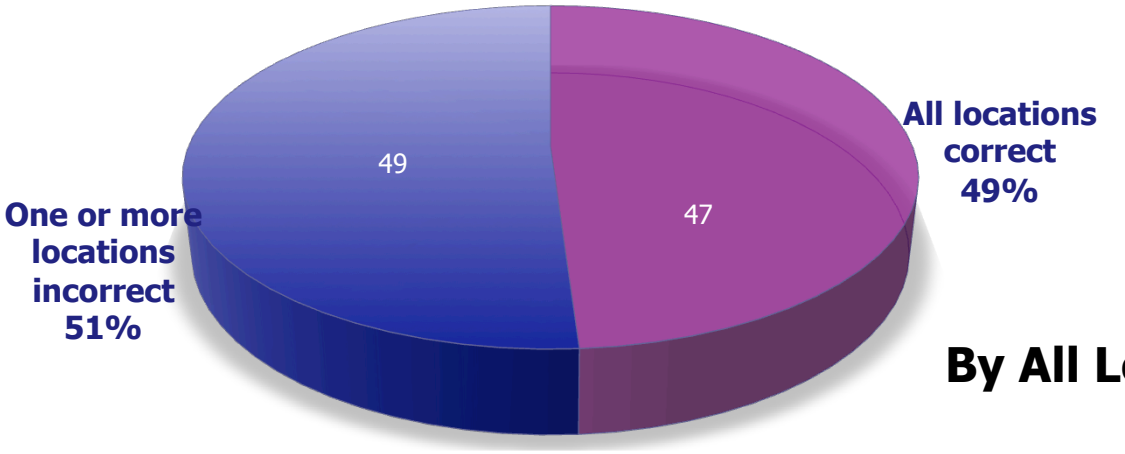
Assessing Accuracy of Reported Data

No. reported CLABSI reviewed	Accurate on all fields reviewed
88	81%

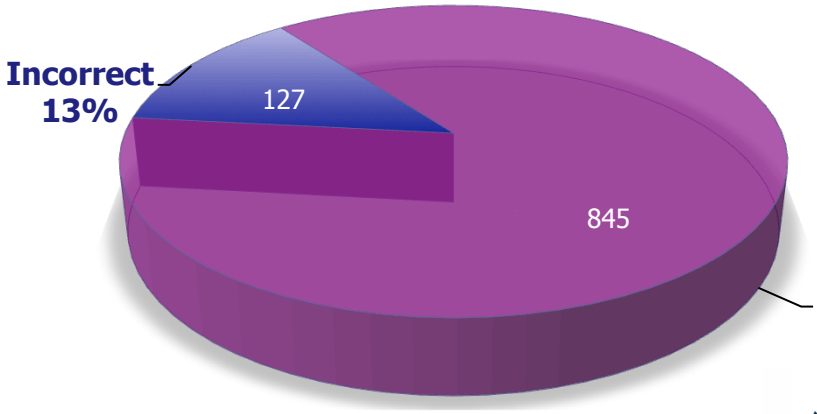


Accuracy of Hospital Unit "Location Mapping"

By Hospital (96)



By All Locations (972)



CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Improving CLABSI Surveillance

Improving CLABSI Case-finding

- Review every positive blood culture from inpatients
  - Make sure you are receiving all final blood culture results
  - Many of the missed CLABSI had simply been MISSED

- First screen: Determine if patient had central line during hospitalization
  - Develop your own method based on available information systems

- Perform internal Validation (minimum once/year)
  - Ask to have retrospective line list of all positive blood culture results produced directly form your hospital's laboratory information system (LIS)
  - Compare to positive blood culture list used for routine CLABSI surveillance

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Know the CLABSI Surveillance Definition (!)

- Criterion 1: Single blood culture if a pathogen, which means any organism other than a common commensal
  - No other symptoms are needed to confirm CLABSI
  - Presence of central line & BSI not related to infection at another site
- Criterion 2: 2 positive blood cultures with same common commensal organism plus 1 of 3 symptoms --- fever, chills, or hypotension
  - Cultures can be drawn up to 2 days apart
  - Considered 2 separate blood draws if from
    - 2 peripheral sites
    - 1 peripheral and 1 central line port
    - 2 different ports from the same central line
    - 2 different central lines
  - Same even if 1 at genus level (e.g. coag negative staph) and the other at species level (e.g. Staph epi)

NHSN List of Common Commensal Organisms

Aerococcus species	Corynebacterium species	Staphylococcus cohnii
Aerococcus urinae	Corynebacterium striatum	Staphylococcus epidermidis
Aerococcus viridans	Corynebacterium ulcerans	Staphylococcus gallinarum
Bacillus cereus	Corynebacterium urealyticum	Staphylococcus haemolyticus
Bacillus species (not B. anthracis)	Corynebacterium xerosis	Staphylococcus hominis
Bacillus subtilis	Diphtheriods	Staphylococcus lentus
Corynebacterium aquaticum	Gram-positive cocci unspecified	Staphylococcus lugdunensis
Corynebacterium bovis	Micrococcus species	Staphylococcus saccharolyticus
Corynebacterium cystitidis	Propionibacterium acnes	Staphylococcus saprophyticus
Corynebacterium glutamicum	Propionibacterium avidum	Staphylococcus schleiferi
Corynebacterium group G-2	Propionibacterium granulosum	Staphylococcus sciuri
Corynebacterium jeikeium	Propionibacterium lymphophilum	Staphylococcus simulans
Corynebacterium kutscheri	Propionibacterium species	Staphylococcus species
Corynebacterium matruchotii	Rhodococcus equi	Staphylococcus warneri
Corynebacterium minutissimum	Rhodococcus species	Staphylococcus xylosus
Corynebacterium mycetoides	Staphylococcus auricularis	Streptococcus anginosus
Corynebacterium pilosum	Staphylococcus capitis ss capitis	Streptococcus bovis
Corynebacterium	Staphylococcus capitis ss unspecified	Streptococcus mitis
Corynebacterium	Staphylococcus capitis ss urealyticus	Streptococcus mutans
Corynebacterium renale	Staphylococcus coagulase negative	Streptococcus salivarius
From NHSN website 9.13.12		Streptococcus viridans species

California Department of PublicHealth

See www.cdc.gov/nhsn/library/

sociated Infections HAI Elimination

Simplified View of CLABSI Definition

Patient with a central line must meet one of the following criterion

1

Patient of any age
- ☐ has a recognized pathogen cultured from one or more blood cultures
  and
- ☐ Organism cultured from blood is not related to an infection at another site

2

Patient of any age
- ☐ has common skin commensals cultured from 2 or more blood cultures drawn on separate occasions
  and

has **at least one** of the following signs or symptoms
- ☐ Fever (> 38°C), chills, or hypotension
  and
- ☐ Signs and symptoms and (+) lab results are not related to an infection at another site

3

Patient ≤ 1 year of age
- ☐ has common skin commensals cultured from 2 or more blood cultures drawn on separate occasions
  and

has **at least one** of the following signs or symptoms:
- ☐ Fever (>38°C core), hypothermia (<36°C core), apnea, or bradycardia
  and
- ☐ Signs and symptoms and (+) lab results are not related to an infection at another

Note: Patient ≤1 year old can meet ANY criteria

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

There 46 NHSN-defined infections in 13 categories

Each infection has a surveillance definition

Many infections can result in BSI

Access definitions via the NHSN website; most up-to-date

Table 1. CDC/NHSN major and specific types of health care–associated infections

UTI	**Urinary tract infection**	
	SUTI	Symptomatic urinary tract infection
	~~ASB~~	~~Asymptomatic bacteriuria~~
	OUTI ABUTI	Other infections of the urinary tract
SSI	**Surgical site infection**	
	SIP	Superficial incisional primary SSI
	SIS	Superficial incisional secondary SSI
	DIP	Deep incisional primary SSI
	DIS	Deep incisional secondary SSI
	Organ/space	Organ/space SSI. Indicate specific type:
		• BONE • LUNG
		• BRST • MED
		• CARD • MEN
		• DISC • ORAL
		• EAR • OREP
		• EMET • OUTI
		• ENDO • SA
		• EYE • SINU
		• GIT • UR
		• IAB • VASC
		• IC • VCUF
		• JNT
BSI	**Bloodstream infection**	
	LCBI	Laboratory-confirmed bloodstream infection
	~~CSEP~~	~~Clinical sepsis~~
PNEU	**Pneumonia**	
	PNU1	Clinically defined pneumonia
	PNU2	Pneumonia with specific laboratory findings
	PNU3	Pneumonia in immunocompromised patient
BJ	**Bone and joint infection**	
	BONE	Osteomyelitis
	JNT	Joint or bursa
	DISC	Disc space
CNS	**Central nervous system**	
	IC	Intracranial infection
	MEN	Meningitis or ventriculitis
	SA	Spinal abscess without meningitis
CVS	**Cardiovascular system infection**	
	VASC	Arterial or venous infection
	ENDO	Endocarditis
	CARD	Myocarditis or pericarditis
	MED	Mediastinitis

Continued

Table 1. Continued

EENT	**Eye, ear, nose, throat, or mouth infection**	
	CONJ	Conjunctivitis
	EYE	Eye, other than conjunctivitis
	EAR	Ear, mastoid
	ORAL	Oral cavity (mouth, tongue, or gums)
	SINU	Sinusitis
	UR	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis
GI	**Gastrointestinal system infection**	
	GE	Gastroenteritis
	GIT	Gastrointestinal (GI) tract
	HEP	Hepatitis
	IAB	Intraabdominal, not specified elsewhere
	NEC	Necrotizing enterocolitis
LRI	**Lower respiratory tract infection, other than pneumonia**	
	BRON	Bronchitis, tracheobronchitis, tracheitis, without evidence of pneumonia
	LUNG	Other infections of the lower respiratory tract
REPR	**Reproductive tract infection**	
	EMET	Endometritis
	EPIS	Episiotomy
	VCUF	Vaginal cuff
	OREP	Other infections of the male or female reproductive tract
SST	**Skin and soft tissue infection**	
	SKIN	Skin
	ST	Soft tissue
	DECU	Decubitus ulcer
	BURN	Burn
	BRST	Breast abscess or mastitis
	UMB	Omphalitis
	PUST	Pustulosis
	CIRC	Newborn circumcision
SYS	**Systemic Infection**	
	DI	Disseminated infection

(<37°C rectal), apnea, bradycardia, dysuria, lethargy, or vomiting
and
patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cc of urine with no more than two species of microorganisms.

4. Patient ≤1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), hypothermia (<37°C), apnea, bradycardia, dysuria, lethargy, or vomiting

Primary BSI (CLABSI) or Secondary BSI ?

- Rule out a CLABSI if patient has a bloodstream infection (BSI) and another site is suspected as being the primary site of infection
  - Review medical record for other primary sites of infection, especially for patients with complex co-morbidities
- IMPORTANT: To classify a BSI as secondary to another site, you must ensure the primary site of infection meets the NHSN surveillance definition
  - If does not meet the NHSN definition, you consider the BSI as the primary infection and report as CLABSI

CLABSI or Secondary BSI (continued)

- Secondary BSIs are not reported as separate events in NHSN
  - When entering Events into NHSN (e.g. SSI, CAUTI, PNEU, etc), there is a data field to indicate the infection resulted in a secondary BSI
- For many surveillance definitions, a positive blood culture is included in the criteria and can help define the infection *(see next slide)*

15 HAI surveillance definitions include "Positive Blood Culture" in their criteria

ABUTI - asymptomatic bacteremic UTI
BONE - osteomyelitis
BURN - burn infection
DECU - decubitus ulcer infection
ENDO – endocarditis
GIT - other GI tract infection
IAB - intraabdominal infection
MED - mediastinitis
MEN – meningitis
OREP - other infection of genital tract
PNU 2, PNU 3 - pneumonia
SA - spinal abscess w/o meningitis
ST - soft tissue infection
UMB - omphalitis
UR - upper respiratory tract infection

CDPH California Department of PublicHealth

Using Lab Findings to Determine CLABSI or Secondary BSI

1. If the primary infection site **is cultured**, the secondary BSI must yield a culture of the same organism as that of the primary site

Example A: Patient has central line. *S. aureus* isolated from both urine and blood cultures. Clinically meets criteria for symptomatic UTI.

Report as SUTI with a secondary BSI

Example B: Patient has central line. *E. coli* isolated from urine. Blood culture with *S. aureus.* Clinically meets criteria for a symptomatic UTI.

Report both a SUTI and CLABSI

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Using Lab Findings to Determine CLABSI or Secondary BSI (continued)

2. If the primary infection site is **NOT cultured**, the secondary BSI must be a pathogen appropriate for the primary site

Example C: Patient with central line has a post-surgical abscess detected by CT scan. No culture of abcess performed. Has blood culture positive for *E. coli*.

Report as SSI-GIT with secondary BSI

Example D: Patient with a central line has acute onset diarrhea and fever. Stool culture not performed. 2 blood cultures positive for coagulase negative staphyloccus.

Report as CLABSI

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Common Infections with Secondary BSI

- During the 2011 data validation reviews, many complex cases were reviewed to confirm or rule-out CLABSI
- Commonly observed infections with secondary BSI were
  - UTI, symptomatic (SUTI)
  - UTI, asymptomatic with bacteremia (ABUTI)
  - Pneumonia meeting criteria 2 or 3 (PNEU 2, 3)
  - GI tract infection (GIT)
  - Intra-abdominal infection (IAB)
  - Osteomylitis (BONE)
  - Endocarditis (ENDO)
  - Deep Incisional and Organ/space SSI

Example: ABUTI

Positive blood culture is in the ABUTI definition and is <u>required</u> to meet the definition.

NHSN has no definition for asymptomatic UTI without BSI.

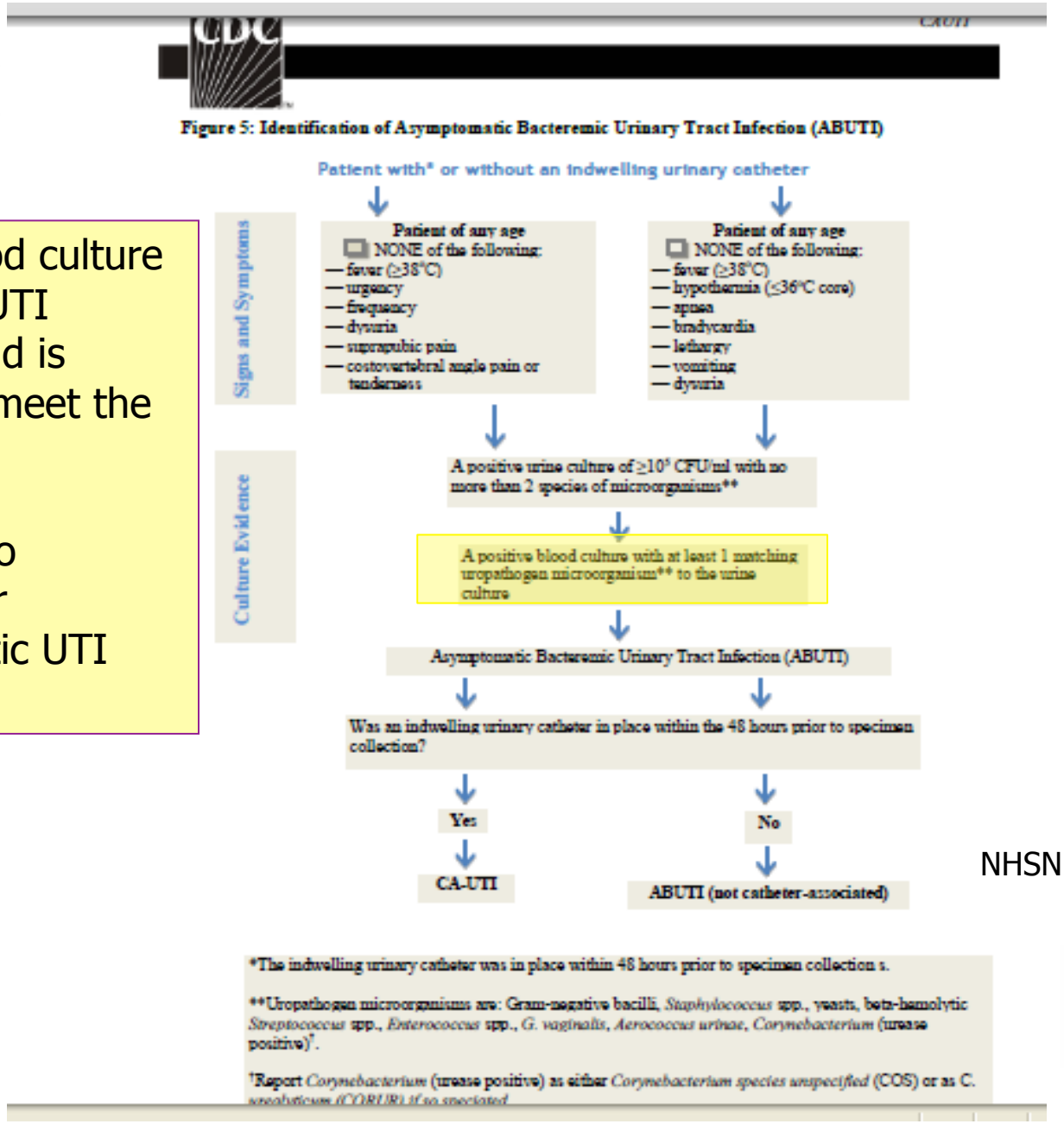


Figure 5: Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

Patient with* or without an indwelling urinary catheter

Signs and Symptoms

Patient of any age
NONE of the following:
- fever (≥38°C)
- urgency
- frequency
- dysuria
- suprapubic pain
- costovertebral angle pain or tenderness

Patient of any age
NONE of the following:
- fever (≥38°C)
- hypothermia (≤36°C core)
- apnea
- bradycardia
- lethargy
- vomiting
- dysuria

Culture Evidence

A positive urine culture of ≥10^5 CFU/ml with no more than 2 species of microorganisms**

A positive blood culture with at least 1 matching uropathogen microorganism** to the urine culture

Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

Was an indwelling urinary catheter in place within the 48 hours prior to specimen collection?

Yes → CA-UTI

No → ABUTI (not catheter-associated)

*The indwelling urinary catheter was in place within 48 hours prior to specimen collection s.

**Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, *Corynebacterium* (urease positive)†.

†Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (COS) or as C. *urealyticum (CORUR) if so speciated*

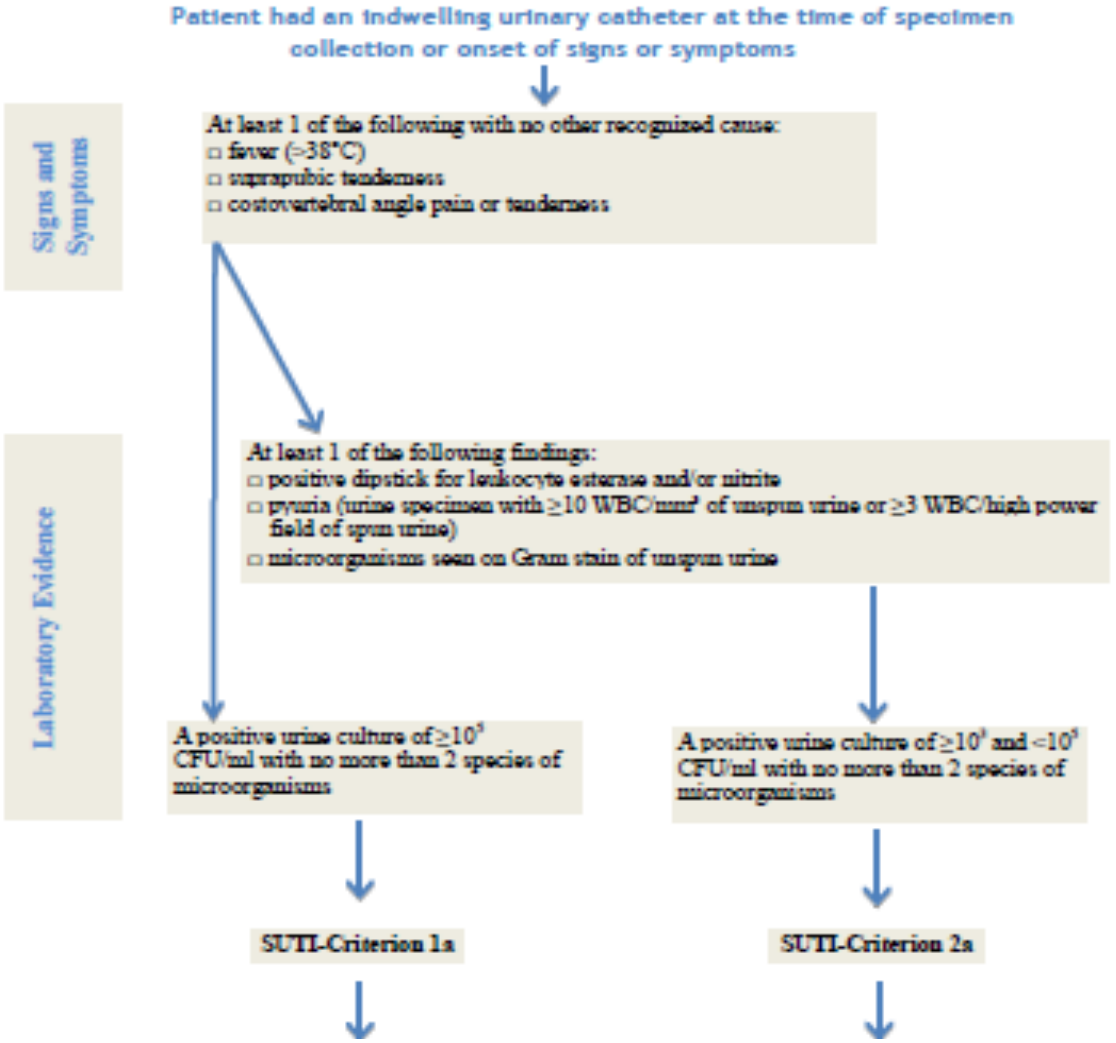
NHSN Ch7 p13

Example:
SUTI

Can have secondary BSI to SUTI, but positive blood culture not in SUTI definition.

Meaning, BSI is not needed or used to define SUTI

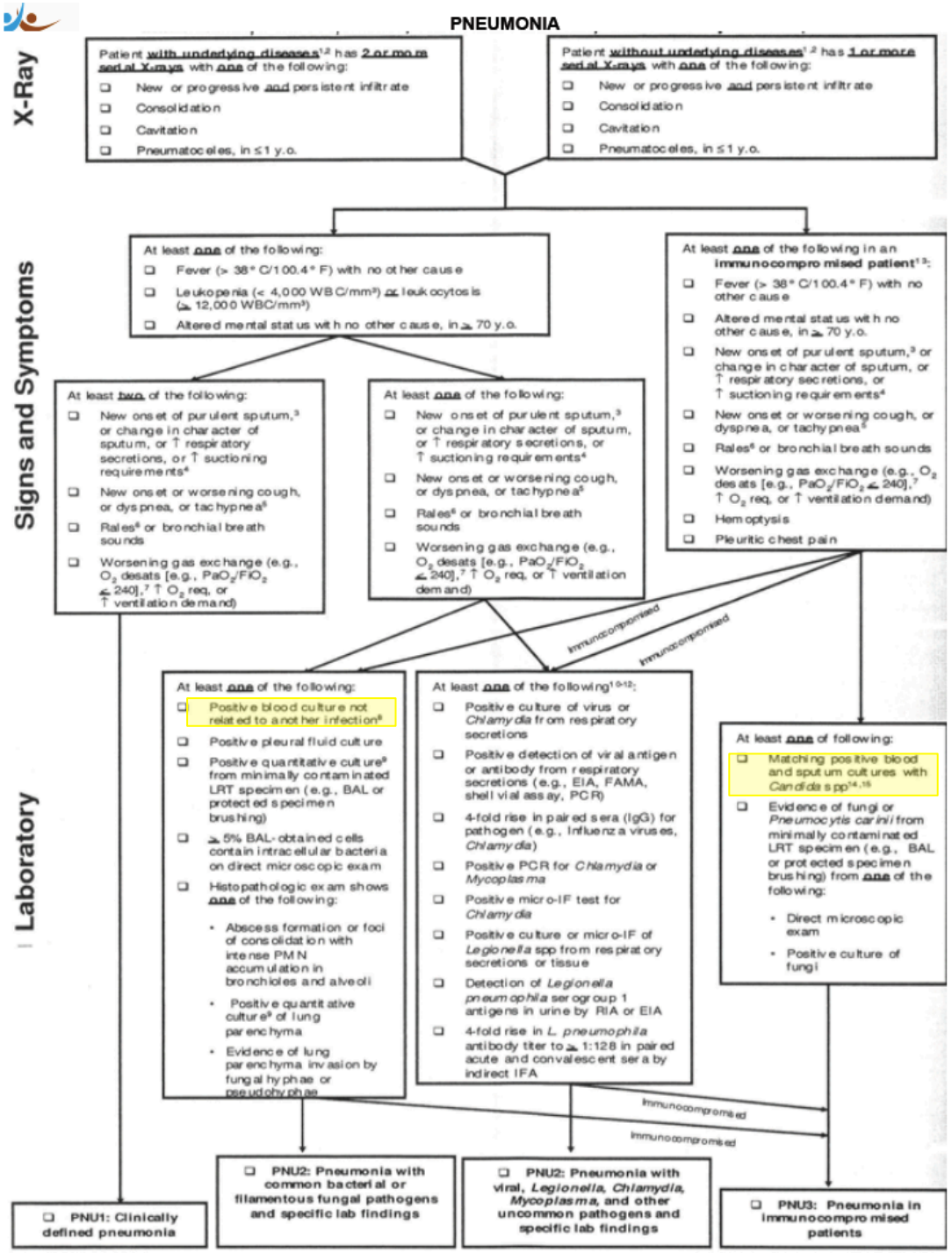
Figure 1: Identification and Categorization of SUTI with Indwelling Catheter (see comments section page 7-8 thru 7-9 for important details)



Example: Pneumonia

Laboratory defined pneumonia (PNU2)

Pneumonia in immuno-compromised patient (PNU



CDPH California Department of PublicHealth

Example: GIT
GI Tract Infection

GIT-Gastrointestinal tract (esophagus, stomach, small and large bowel, and rectum) excluding gastroenteritis and appendicitis

Gastrointestinal tract infections, excluding gastroenteritis and appendicitis, must meet at least *1* of the following criteria:

1. Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause and compatible with infection of the organ or tissue involved: fever (>38°C), nausea, vomiting, abdominal pain, or tenderness
   and
   at least *1* of the following:
   a. organisms cultured from drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
   b. organisms seen on Gram's or KOH stain or multinucleated giant cells seen on microscopic examination of drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
   c. organisms cultured from blood
   d. evidence of pathologic findings on radiographic examination
   e. evidence of pathologic findings on endoscopic examination (eg, *Candida* esophagitis or proctitis).

NHSN Ch.17 p24

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Example: IAB - Intraabdominal Infection

IAB - Intraabdominal, not specified elsewhere including gallbladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, subphrenic or subdiaphragmatic space, or other intraabdominal tissue or area not specified elsewhere

Intraabdominal infections must meet at least 1 of the following criteria:

- ☐ 1. Patient has organisms cultured from purulent material from intraabdominal space obtained during a surgical operation or needle aspiration.
- ☐ 2. Patient has abscess or other evidence of intraabdominal infection seen during a surgical operation or histopathologic examination.
- ☐ 3. Patient has at least 2 of the following signs or symptoms with no other recognized cause: ☐fever (> 38°C), ☐nausea, ☐vomiting, ☐abdominal pain, or ☐jaundice

  and

  at least 1 of the following:

  ☐organisms cultured from drainage from surgically placed drain (eg. closed suction drainage system. open drain. T-tube drain)

  ☐organisms seen on Gram's stain of drainage or tissue obtained during surgical operation or needle aspiration

  ☐organisms cultured from blood *and* radiographic evidence of infection (eg. Abnormal findings on ultrasound, CT scan. MRI, or radiolabel scans [gallium. technetium, etc] or on abdominal x-ray).

Reporting instruction

- Do *not* report pancreatitis (an inflammatory syndrome characterized by abdominal pain, nausea, and vomiting associated with high serum levels of pancreatic enzymes) unless it is determined to be infectious in origin.

NHSN Ch.17 p24

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Example: BONE Osteomyelitis

BJ–BONE AND JOINT INFECTION

BONE-Osteomyelitis

Osteomyelitis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from bone.
2. Patient has evidence of osteomyelitis on direct examination of the bone during a surgical operation or histopathologic examination.
3. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), localized swelling, tenderness, heat, or drainage at suspected site of bone infection
   and
   at least *1* of the following:
   a. organisms cultured from blood
   b. positive blood antigen test (eg, *H influenzae*, *S pneumoniae*)

NHSN Ch.17 p14

Data Correction

- Remember, if you note any errors or omissions, you can always go back and edit NHSN records to correct your data
- If you find errors that require you to make numerous changes to your data after it has been entered into NHSN, record date when changes made
- Keep records of clinical or systems issues that may change your blood culture data to help understand variation over time

  Examples include:

  - Focused education for phlebotomy / blood specimen collection processes
  - Reducing blood specimens drawn from central lines
  - Introduction of 3rd party HAI surveillance software
  - Changes in laboratory practices or lab systems

Remember that the "power of surveillance is in sharing findings with those who need to know and who can act on the findings to improve patient safety"

"Recommended Practices for Surveillance"
AJIC Am J Infect Control 2007; 35:427-40

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

Report and Use CLABSI Data

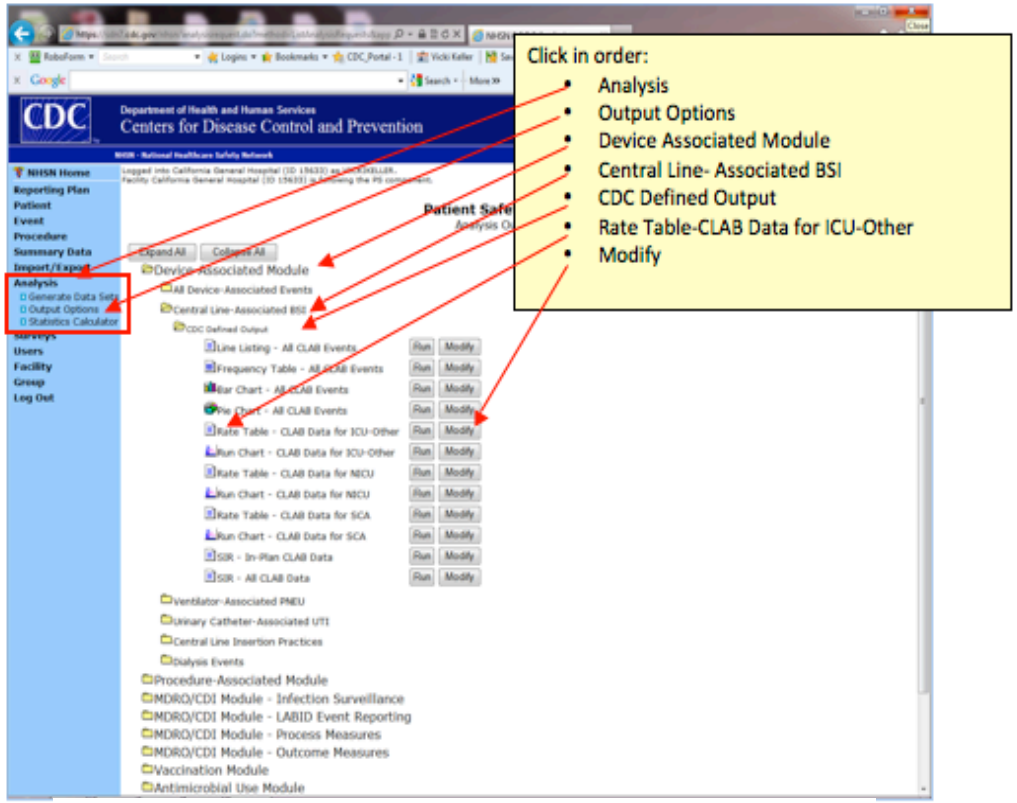
- Use NHSN analysis features to review and interpret your data
- Plan for distribution of findings, reporting to healthcare providers most able to impact patient care
- Report in a manner to demonstrate prevention progress or spark need for improvement
  - Use visual displays of data - charts, graphs, tables

CDPH California Department of PublicHealth

Using NHSN Analysis Features for Prevention: CLABSI

By using the Analysis function in NHSN, you can verify that all your monthly summary data (patient days and central line days) and events (CLABSI) have been entered. We will demonstrate various ways to look at the data, assess significance of changes (increases or decreases) over time, and identify variables to consider when reporting data to your hospital committees.

1. Always begin by generating a data set prior to using the Analysis feature to be sure all data are current.
2. In the NHSN Portal click Analysis →Output Options→Device Associated Module→ Central Line-Associated BSI→ CDC Defined Output→ Rate Table – CLAB Data for ICU-Other→Modify.



See Analysis Guidance series at www.cdph.ca.gov/HAI

Steps for Advancing CLABSI Prevention Using Your NHSN Data

- Think beyond public reporting and hospital-to-hospital comparisons
- Focus on CLABSI prevention progress within your hospital units over time (requires you to find *all* CLABSI that occur)
- Set CLABSI prevention goals and targets
- Remember the 4 C's of surveillance data quality
  - Consistency, coordination, confidence, compassion
  - Establish systems' approaches for identifying CLABSI and capturing accurate line days and patient days
  - Don't go it alone anymore!

CDPH California Department of PublicHealth

Healthcare-associated Infections HAI Elimination

CLABSI Data Validation Process and Forms

CLABSI Validation - Form A
Summary of Positive Blood Culture Laboratory Data

Instructions: To begin validation of CLABSI, ask your laboratory to produce a line list directly from the laboratory information system for a 3-month time period to include

☐ **Positive blood cultures** from inpatients for each of 3 months

Reports should include date of admission to the hospital if possible.
Ask to have printed twice: sorted by date and then sorted by patient name or medical record number.

Months selected for validation:

☐Jan ☐Feb ☐Mar ☐Apr ☐May ☐Jun ☐Jul ☐Aug ☐Sep ☐Oct ☐Nov ☐Dec

Laboratory information system (LIS): _____*e.g.Meditech, Sunquest, Cerner*

IMPORTANT: For validation, do not produce this positive blood culture line list from a surveillance software system (e.g. Medmined, TheraDoc, AICE, etc) or infection control integration software programs. Get directly from LIS.

STEP 1: From positive blood cultures from **Inpatients only, indicate total each MONTH**:

☐ Month _____ # ____ ☐ Month _____ # ____ ☐ Month _____ # ____

STEP 2: Determine number of months to include in CLABSI validation.

If total inpatient positive blood cultures in 3 mo. is	***Perform review for***	
≤ 60	*all 3 months*	
>60 and <120	*2 months*	*Select the month with the **greatest #,** then a 2nd month that makes a 2-month total closest to 60*
≥120	*1 month*	*Select the month with the **greatest #***

In general, starting with 60 positive blood cultures results in approximately 40-55 infectious event "clusters" and will result in in-depth chart review of 10-15 records. The remaining generally require only cursory review to identify or rule out CLABSI (often accomplished using data available through EMR systems). The likelihood of identifying CLABSI is based on your underlying rate and the number of positive blood cultures you include in your validation.

STEP 3: Check the boxes next to months (above) you are including in the CLABSI validation review.

Positive blood cultures from **Inpatients** during months ✓'d to include in review_____

Separate BSI Events* _____ **[INCLUDE IN CLABSI REVIEW]**

***Event** = "Cluster" of positive blood cultures near same date for same patient counts as 1 event; single positive blood cultures also count as 1 event*

STEP 4: On your lab line list, number each BSI event.

STEP 5: For each numbered BSI event, enter the corresponding culture date (1st positive) and admission date in table on **Form 4**. Follow instructions on **Form 4** to complete review.

OPTIONAL STEP: For most comprehensive review, review positive blood cultures from ED patients for recent hospital discharge (and presence of central line in previous 48 hours)

_____ **[INCLUDE IN CLABSI REVIEW AS POSSIBLE]** Add recent discharges to table on Form

CLABSI Validation – Form B
BSI Events Table

Instructions:

1. Fill in first specimen date for each BSI event in table below. Numbers should correspond to laboratory line list (see Form A).
2. Use Analysis to produce CLABSI line list for the 1,2, or 3-month review period. Also print NHSN Event record for each reported CLABSI..
3. For each numbered BSI event, answer Q1 by referring to your NHSN line list. For cases reported to NHSN, record NHSN Event #. If CLABSI on your NHSN list but were not on lab line list, add to the bottom of the table.
4. For each BSI event, review patient's medical record to verify your decision to report or not report to NHSN. Carefully follow NHSN protocols and surveillance definitions; refer to them often.
   - For each CLABSI **Reported** to NHSN, complete a Form C, CLABSI Validation Review. Record info on table in 1 of 2 columns as shown.
   - For each BSI event **NOT** reported to NHSN, indicate reason why in the appropriate column. Use Form D as worksheet if needed. If BSI event should have been reported as a CLABSI but was not, record as missed. Indicate a reason the case may have been missed.
5. Complete Form E, CLABSI Validation Findings.

When review complete, make all needed corrections to your data in NHSN!

BSI Events Table.

Lab list #	**First positive blood culture of each BSI Event** Specimen date	Admission date	**Q1.** Was Event reported to NHSN as a CLABSI? **YES** √ **NHSN Event#**	**NO** √	If **YES** to Q1: Perform medical record review, complete **Form 5**, then fill in 1 of columns below. Not a CLABSI Reported in error **Why?**	*Data fields correctly reported to NHSN? √ **If NO, List**	If **NO** to Q1: Perform medical review. Use BSI review work sheet if helpful. Stop as soon as you can complete one of the columns below. **NO central line** or no line in previous 48 hours	**Present on admission** and not discharged in previous 48 hours	**Contaminant** i.e. Common skin commensals: Single +bld cx	≥2 +bld cx but no S/S	**Secondary BSI** Primary site of infection	**MISSED** CLABSI Should have been reported
1	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	___/___/11	___/___/11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Column totals:					_____							_____

CLABSI Validation – Form C

☐**Confirm Accuracy of Reported CLABSI** -OR- ☐**Record CLABSI that was Missed**

✓one

Instructions: Complete for each reported CLABSI from Form B. Check box (☑) if data field correct as reported to NHSN or fill-in correct information. -OR- use form to collect data for Missed CLABSI by filling-in all fields.

Lab Line List# _____ 1st positive blood culture ___/___/11 NHSN Event #: _____

Patient ID:

Gender: F M Other | Date of Birth: ___/___/___

Event Type: BSI | **Date of Event (onset):** ☐ **___/____/11**

MDRO Infection Surveillance: ☐ "Yes, this infection's pathogen & location are not in-plan for Infection Surveillance in the MDRO/CDI Module"
☐ "No, this infection's pathogen & location are **not** in-plan for Infection Surveillance in the MDRO/CDI Module"

Date Admitted to Facility: ☐ **___/____/11** | **Location Attribution:** ☐ **_____**

Risk Factors

☒ Mark Relevant Location ☑If Reported Correctly

___If ICU/Other locations
Central line: Yes No ☐

___If Specialty Care Area,
Permanent central line: Yes No ☐
Temporary central line: Yes No ☐

___If NICU,
Non-umbilical central line: Yes No ☐
Umbilical catheter:: Yes No ☐
Birth weight (grams): _____ ☐

Location of Device Insertion: _____ *optional*

Date of Device Insertion: ____/_____/11 *optional*

☐ **Medical record review revealed NOT a CLABSI**

Reason reported in error: :

Event Details

Specific Event: Laboratory-confirmed BSI

Criteria:
Signs & Symptoms *NOTE: S/S needed only if common skin commensal*

Any patient
☐ Fever
☐ Chills
☐ Hypotension

≤1 year old
☐ Fever
☐ Hypothermia
☐ Apnea
☐ Bradycardia

Laboratory

☐ Recognized pathogen from one or more blood cultures

☐ Common skin commensal from ≥2 blood cultures

Died: Yes No | If Died, BSI Contributed to Death: Yes No

Pathogen/s: ☐**Reported Correctly** If VRE or MRSA, reported also as LabID? ☐Yes ☐No

_____

CLABSI Validation – Form D
Chart Review Work Sheet

Instructions: Use for notes when reviewing BSI Events (from Form B) to either rule out or confirm CLABSI. Record final determination by checking appropriate boxes. Transfer findings to BSI Events table, Form B.

☐ 1. BSI event from patient with no central line present or during previous 48 hours.

☐ 2. BSI associated with Infection that was **PRESENT ON ADMISSION** from patient not recently discharged from hospital in the previous 48 hours.

☐ 3. Positive blood culture was determined to be a **CONTAMINANT**, i.e. common commensal organism(s) from
- ☐ only one positive culture within a 2 day period
- ☐ 2 cultures on separate occasions, but patient with no signs/symptoms of infection

4. Infection was a **BSI SECONDARY TO ANOTHER SITE OF INFECTION**.

☐ UTI	☐ SSI
☐ PNEU	☐ Bone/Joint
☐ Central nervous system	☐ Cardiovascular
☐ EENT or URI	☐ LRI
☐ GI	☐ Reproductive tract
☐ Skin/ Soft tissue	☐ Systemic

Refer to NHSN Infection definitions to be sure criteria for primary infection site have been met!

☐ 5. Infection met NHSN surveillance criteria for **CLABSI**, and should have been reported to NHSN. Complete **Form 5,** CLABSI Review Form.

MEDICAL RECORD REVIEW: **Lab Line List# ___** **1st positive blood culture of Event ___/___/11**

HOSPITALIZATION

Hospital Admission Date___/___/___ *Reason for Admission_____*
Admitted from Home SNF Dialysis
Discharge Date ___/___/___ *Discharge disposition_____*
Date of 1st +blood Culture __/__/__ *Hospital location at time of 1st positive culture:_____*
Date admitted to location: __/__/__ *If on unit < 48 hrs, previous location _____*

CENTRAL LINE HISTORY

Date of initial central line insertion ___/___/___ *Location of Line Insertion _____*
Line type: _____ *Insertion site_____ Removal _____*
Date of 2nd central line insertion ___/___/___ *Location of Line Insertion _____*
Line type: _____ *Insertion site_____ Removal _____*
Date of 3rd central line insertion ___/___/___ *Location of Line Insertion _____*
Line type: _____ *Insertion site_____ Removal _____*

CLINICAL NOTES

_____
_____
_____
_____
_____

Date ____/2011 Reviewer's Name: _____

CLABSI Validation – Form E
CLABSI Validation Findings

Validation results can be displayed using 2x2 tables and the accuracy and completeness of HAI surveillance and reporting can be calculated. Quantitative findings of data validation include sensitivity, specificity, and positive predictive value (defined below).

		Validation Review (Considered "Gold Standard" or truth)	
		CLABSI	Not CLABSI
Identified and Reported by Hospital	CLABSI	True positives	**False positives**
	Not CLABSI	**False negatives**	True negatives

Positive Predictive Value (PPV) =
$\frac{\text{True positives}}{\text{True positives + False positives}}$ X 100

Sensitivity =
$\frac{\text{True positives}}{\text{True positives + False negatives}}$ X 100

Specificity =
$\frac{\text{True negatives}}{\text{True negatives + False positives}}$ X 100

Sensitivity

- Answers question "How likely are all true infections found?"
- For CLABSI surveillance, sensitivity is defined as the proportion of CLABSI identified and reported from the total of all patients who had a CLABSI.
- If sensitivity is high, it means CLABSI are being identified during surveillance. If sensitivity is low, it means CLABSI are being missed and the hospital's CLABSI rate could be higher than what is being reported.
- Measures **completeness** and implies effective surveillance methods for case-finding.

Specificity

- Answers question "How likely are patients without an infection accurately identified as not having an infection?"
- For CLABSI surveillance, specificity is defined as the proportion of CLABSI not reported from the total of all patients who did not have a CLABSI.
- If specificity is high, it means CLABSI are being ruled out appropriately among patients with positive blood cultures. If specificity is low it means that CLABSI are being reported that are not really CLABSI. The hospital's CLABSI rate may actually be lower than what is being reported.

Positive Predictive Value (PPV)

- Also called the precision rate.
- For CLABSI surveillance, PPV is the proportion of CLABSI reported that met the case definition.
- If PPV is high, it means the identified and reported CLABSI really *are* CLABSI. If PPV is low, it means CLABSI being reported do not meet the case definition.
- Measures **accuracy** in applying surveillance definitions and following protocols.

Example

Positive blood cultures events reviewed for validation = **100**		Validation Review ("Gold Standard" or truth)	
		CLABSI	Not CLABSI
Identified and Reported by Hospital	CLABSI **5**	4	**1** Reported in error
	Not CLABSI **95**	**2** Missed	93

Positive Predictive Value (PPV) = 4 True positives / (4 True pos. + 1 False pos.) X 100 = **80%**

Sensitivity = 4 True positives / (4 True pos. + 2 False neg.) X 100 = **67%**

Specificity = 93 True negatives / (93 True neg. + 1 False pos.) X 100 = **99%**

Interpretation:

For the 100 blood culture events reviewed for CLABSI, the validation reviewers found **5** disparities compared to the hospital surveillance report.

The hospital had identified and reported 5 CLABSI. The validation reviewers determined only 4 should have been reported; **1** did not meet the surveillance criteria.

The calculated **positive predictive value (PPV)** reveals that what routine hospital surveillance identifies as CLABSI meets the CLABSI surveillance criteria only 80% of the time.

For the other 95 positive blood culture events reviewed in which routine hospital surveillance identified no CLABSI, the validation reviewers identified **2** additional CLABSI.

The calculated **sensitivity** reveals routine hospital surveillance is identifying only 67% of the CLABSI occurring (1/3 are being missed).

The calculated **specificity** reveals hospital routine surveillance accurately "rules out" CLABSI 99% of the time.

Data Validation for CLABSI

Hospital: _____

Surveillance time period: _____

From BSI Events Table, Form 4

positive blood culture events reviewed = _____

		Validation Review	
		CLABSI	**Not CLABSI**
Identified and Reported by Hospital	**CLABSI ____** *Form B, total Q1 = Yes*	**A**	**B** *Reported in Error*
	Not CLABSI ____ *Form B total Q1 = No*	**C** *Missed*	**D**

Sensitivity = $\frac{A}{A + C}$ X 100 = _____

Specificity = $\frac{D}{D + B}$ X 100 = _____

Positive Predictive Value = $\frac{A}{A + B}$ X 100 = _____

Infection Definitions Worksheets

Instructions:
1) Use when reviewing positive blood cultures for determining and documenting whether a positive blood culture is a primary BSI (CLABSI), secondary BSI to another site of infection, or a contaminant.
2) Use for surgical site infection (SSI) surveillance.
3) DO NOT use for **LabID** CDI or MRSA-VRE BSI surveillance. Use LabID methods in the MDRO/CDI Module protocol.
4) Refer to often when performing surveillance. Make notes on individual infection pages as you are reviewing medical records.

GASTROINTESTINAL SYSTEM INFECTIONS

GE - Gastroenteritis

Gastroenteritis must meet at least 1 of the following criteria:

☐ 1. Patient has an acute onset of diarrhea (liquid stools for more than 12 hours) with or without vomiting or fever (> 38°C) and no likely noninfectious cause (eg. diagnostic tests therapeutic regimen other than antimicrobial agents. Acute exacerbation of a chronic condition. or psychologic stress).

☐ 2. Patient has at least 2 of the following signs or symptoms with no other recognized cause: ☐nausea, ☐vomiting, ☐abdominal pain, ☐fever (>38°C), or ☐headache
and
at least 1 of the following:

a. ☐an enteric pathogen is cultured from stool or rectal swab
b. ☐an enteric pathogen is detected by routine or electron microscopy
c. ☐an enteric pathogen is detected by antigen or antibody assay on blood or feces
d. ☐evidence of an enteric pathogen is detected by cytopathic changes in tissue culture (toxin assay)
e. ☐diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (lgG) for pathogen.

GIT- Gastrointestinal tract (esophagus, stomach, small and large bowel, and rectum) excluding gastroenteritis and appendicitis

Gastrointestinal tract infections, excluding gastroenteritis and appendicitis, must meet at least 1 of the following criteria:

☐ 1. Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination.

☐ 2. Patient has at least 2 of the following signs or symptoms with no other recognized cause and compatible with infection of the organ or tissue involved: ☐fever (>38°C), ☐nausea, ☐vomiting. ☐abdominal pain, or ☐tenderness
and
at least 1 of the following:
☐organisms cultured from drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
☐organisms seen on Gram's or KOH stain or multinucleated giant cells seen on microscopic examination of drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
☐organisms cultured from blood
☐evidence of pathologic findings on radiographic examination
☐evidence of pathologic findings on endoscopic examination (eg. *Candida* esophagitis or procti)

HEP - Hepatitis

Hepatitis must meet the following criterion:

☐ Patient has at least 2 of the following signs or symptoms with no other recognized cause: ☐fever (>38°C), ☐anorexia, ☐nausea, ☐vomiting, ☐abdominal pain, ☐jaundice, or ☐history of transfusion within the previous 3 months
and
at least 1 of the following:

a. ☐positive antigen or antibody test for hepatitis A, hepatitis B, hepatitis C. or delta hepatitis
b. ☐abnormal liver function tests (eg. elevated ALT/AST. bilirubin)
c. ☐cytomegalovirus (CMV) detected in urine or oropharyngeal secretions.

Reporting instructions

- Do *not* report hepatitis or jaundice of noninfectious origin (alpha-l antitrypsin deficiency. etc).
- Do *not* report hepatitis or jaundice that results from exposure to hepatotoxins (alcoholic or acetaminophen-induced hepatitis. etc).
- Do *not* report hepatitis or jaundice that results from biliary obstruction (cholecystitis).

en Español
- Su salud en su idioma

Most Popular Links
- Birth, Death, & Marriage Certificates
- Licensing and Certification
- WIC

Quick Links
- About Us
- Decisions Pending & Opportunities for Public Participation
- Diseases & Conditions
- Job Opportunities
- Local Health Services
- Newsroom
- Public Availability of Documents

Related Links
- California Health and Human Services Agency
- Department of Health Care Services (includes Medi-Cal)
- State Agencies Directory

Home > Programs > Healthcare Associated Infections Program

Healthcare Associated Infections (HAI) Program

The Healthcare Associated Infections (HAI) Program is one of three programs in the Center for Health Care Quality of the California Department of Public Health. The Program is responsible for the surveillance, reporting, and prevention of infections in California's general acute care hospitals as mandated by Senate Bills 739, 1058, and 158. The Program was authorized in December 2009.

HAIs are the most common complication of hospital care and are listed among the top ten leading causes of death in the United States. It is estimated that each year there are more than 1.7 million infections, 99,000 deaths, and $3.1 billion dollars in excess healthcare costs in acute care hospitals alone. Based on this data it is estimated that approximately 200,000 infections occur in California each year with an annual cost of about $600 million - $1.6 billion. The vision of the HAI Program is to eliminate HAIs for California patients.

Healthcare Associated Infections

- New HAI Information and Reports
  Links to All Pages on HAIs and Mandatory Public Reporting

Healthcare Associated Infections - Advisory Committee

- New HAI-AC Recruitment Page
- HAI Advisory Committee

Information for Infection Prevention Programs

- AFLs, Legislation, and Regulations
- New Using NHSN Data Validation for Improved HAI Surveillance and Prevention (New Page)
- New Using NHSN Analysis for Prevention Guidance Series
- Basics of Infection Prevention 2 Day Mini Course
- NHSN Guidance Specific to California Hospitals
- California Infection Control and Prevention Guidelines
- HAI Liaison Program - IP Assignments by County (PDF, New Window)

Influenza Information

- Healthcare Personnel Influenza Vaccination
- Influenza Vaccination Information for Consumers

Resources

- Selected links to the Association of Professionals in Infection Control and Hospital Epidemiology (APIC)
- Selected links to the Centers for Disease Control and Prevention (CDC)
- Selected links to the Society for Healthcare Epidemiology of America (SHEA)

Public Reporting - Healthcare Associated Infections

- New My Hospital - Healthcare Associated Infections
  Interactive Map
- New Central Line associated Bloodstream Infection (CLABSI) 2011
- New Methicillin-resistant Staphylococcus aureus (MRSA) and Vancomycin-resistant Enterococcus (VRE) 2011
- New Surgical Site Infections 2011
- Clostridium difficile Infection (CDI)
  2011 data will be published soon

Public Reporting – Prevention Measures

- New Central Line Insertion Practices (CLIP)
- Surgical Site Infection Prevention Measures
  Mandatory Reporting

Antimicrobial Resistance

- New California Antibiogram Project
- The California Antimicrobial Stewardship Program Initiative

Contact

- HAI Program

Questions?

Email
InfectionControl@cdph.ca.gov
or
Your designated HAI Liaison IP
FirstName.LastName@cdph.ca.gov

Lynn.Janssen@cdph.ca.gov